

Climate Change Rating of OECD 2020

Joseph Nowarski, M.Sc., ME – Energy Conservation Expert

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Abstract

This work is related to the Climate Change Rating of Countries (CCR). The parameters included in the rating are CO₂ emissions per capita and per GDP, cumulative CO₂ emissions in the last 30 years, and change in the emissions in the last 10 years.

The parameters are compared to the world averages.

The A-G rating groups are according to the CCR limits. The best rating (A) is for the lowest CCR, which means the lowest CO₂ intensity.

OECD CCR is 107, about 7% worse than the world average.

OECD has Label F, red.

OECD position on the CCR countries list is equivalent to 153 (out of 208).

Keywords:

Climate Change, Global Warming, CO₂ emissions, CO₂ per capita, CO₂ per GDP, CO₂ emissions per capita, CO₂ emissions per GDP, Climate Change Rating, Global Warming of countries, OECD, climate justice, carbon justice

Glossary

\$\$GDP	\$2017 of cumulative GDP in the last 30 years
Ave	average
CCO2	global cumulative CO2 emissions according to publication [1], CO2 emissions produced from fossil fuels and cement production only – land use change is not included, tCO2
CCp\$\$	country's cumulative CO2 emissions in the last 30 years per cumulative GDP in the same period
CCp\$\$W	weight of parameter CCp\$\$
CCR	Climate Change Rating of countries according to this work
CGP	Conservative Global Parameter, decreasing only world parameter applied to the CCR
CO2	emissions of Carbon Dioxide, CO ₂
Cp\$	country's CO2 emissions per GDP in the last year, tCO2/\$GDP (ton CO2 per year, per \$GDP 2017 per year)
Cp\$10	country's change in Cp\$ in last 10 years, tCO2/\$GDP
Cp\$10W	weight of parameter Cp\$10
Cp\$W	weight of parameter Cp\$
CpC	country's CO2 emissions per capita in the last year, tCO2/y,cap
CpC10	country's change in CpC in last 10 years, tCO2/y,cap
CpC10W	weight of parameter CpC10
CpCW	weight of parameter CpC
GDP	Gross Domestic Product, constant international \$ 2017, \$GDP/y
Global Warming	global surface temperature change over land+ocean above 1850-1900 baseline, °C
OWID	Our World in Data – Internet site [1]
tCO2	metric ton of CO2

tCCO2	metric ton of cumulative CO ₂ in the last 30 y
tCO ₂ /y,cap	metric ton of CO ₂ per year, per capita
WB	World Bank
WCCp\$\$	world cumulative CO ₂ emissions in last 30 years per cumulative GDP, tCO ₂ /\$GDP
WCp\$	world CO ₂ emissions per GDP in the last year, tCO ₂ /\$GDP
WCp\$10	world change in Cp\$ in last 10 years, tCO ₂ /\$GDP
WCpC	world CO ₂ emissions per capita in the last year, tCO ₂ /y,cap
WCpC10	world change in CpC in last 10 years, tCO ₂ /y,cap

Climate Change Rating of Countries

Climate Change Rating of Countries (CCR) was introduced in the publication [1]. The parameters included in the rating are CO₂ emissions per capita and per GDP, cumulative CO₂ emissions in the last 30 years, and change in the last 10 years. The parameters are compared to the world averages. The rating is related to the CO₂ intensity, lower CO₂ emissions result in a lower CCR value and better rating.

Parameters Included in the Rating

Table 1 - Parameters included in the rating

Parameter	Country Symbol	World Symbol	Unit
CO ₂ emissions per capita	CpC	WCpC	tCO ₂ /y,cap
CO ₂ emissions per GDP	Cp\$	WCp\$	tCO ₂ /\$GDP
Cumulative CO ₂ in the last 30 years per cumulative GDP in the same period	CCp\$\$	WCCp\$\$	tCO ₂ /\$GDP
Change in CpC in the last 10 years	CPC10	WCPC10	tCO ₂ /y,cap
Change in Cp\$ in the last 10 years	CP\$10	WCP\$10	tCO ₂ /\$GDP

Weights of the CCR Parameters

Table 2 - CCR parameters weight

Parameter	Parameter Symbol	Weight	Weight Symbol
Cumulative CO2 in the last 30 years per cumulative GDP in the same period	CCp\$\$	20%	CCp\$\$W
CO2 emissions per capita	CpC	25%	CpCW
CO2 emissions per GDP	Cp\$	25%	Cp\$W
Change in CpC in the last 10 years	CpC10	15%	CpC10W
Change in Cp\$ in the last 10 years	Cp\$10	15%	Cp\$10W
Σ		100%	

Table 3 - World data for 2020 [1]

Parameter	Symbol	Unit	World 2020
CO2 emissions in 2020		tCO2/y	34,325,692,000
GDP		\$GDP/y	126,732,219,588,076
Population			7,840,952,832
Cumulative CO2 emissions in the last 30 years		tCCO2	864,284,220,582
Cumulative GDP in the last 30 years		\$\$GDP	2,590,775,267,367,470
Cumulative CO2 in the last 30 years per cumulative GDP in the same period	WCCp\$\$	tCCO2/\$\$GDP	0.000334
CO2 emissions per capita	WCpC	tCO2/y,cap	4.38
CO2 emissions per GDP	WCp\$	tCO2/\$GDP	0.000271
CpC before 10 years		tCO2/y,cap	4.62
Cp\$ before 10 years		tCO2/\$GDP	0.000332
Last CpC to CpC before 10 years	CpC10	tCO2/y,cap	95%
Last Cp\$ to Cp\$ before 10 years	Cp\$10	tCO2/\$GDP	81%

Rating A-G

Rating A-G includes 7 groups.

The A-G rating groups are according to the rating limits. The best rating (A) is for the lowest CCR, which means the lowest CO₂ intensity.

Table 4 - A-G Labels (groups)

Rating	min CCR	max CCR	Color
A		57	Light Green
B	58	68	Dark Green
C	69	77	Light Blue
D	78	89	Dark Blue
E	90	105	Violet
F	106	150	Red
G	151		Black

OECD and the World

Table 5 - OECD and the world in 2020

2020	World	OECD	Share	Δ
countries	208	38	18%	
population	7,840,952,832	1,370,360,741	17%	
GDP, M\$	126,732,220	58,292,208	46%	
CO ₂ emissions, tCO ₂ /y	34,325,692,000	11,251,383,490	33%	
population/country	37,696,889	36,062,125		-4%
GDP/country, M\$	609,290	1,534,005		+152%
GDP/capita, \$	16,163	42,538		+163%
CO ₂ /country	165,027,365	296,089,039		+79%
CO ₂ /capita	4.4	8.2		+88%
CO ₂ /GDP, tCO ₂ /M\$	271	193		-29%

Climate Change Rating of OECD Countries

Table 6 - OECD data for 2020 [1]

Parameter	Symbol	Unit	OECD	CGP	OECD to CGP
CO2 emissions in 2020	CO2	tCO2/y	11,251,383,490	34,325,692,000	33%
GDP	GDP	\$GDP/y	58,292,208,103,218	126,732,219,588,076	46%
Population			1,370,360,741	7,840,952,832	17%
Cumulative CO2 emissions in the last 30 years	CCO2	tCCO2	391,837,198,504	864,284,220,582	45%
Cumulative GDP in the last 30 years	ΣGDP	\$GDP	1,414,425,138,201,230	2,590,775,267,367,470	55%
Cumulative CO2 in the last 30 years per cumulative GDP in the same period	CCp\$\$	tCO2/\$GDP	0.000277	0.000334	83%
CO2 emissions per capita	CpC	tCO2/y,cap	8.211	4.378	188%
CO2 emissions per GDP	Cp\$	tCO2/\$GDP	0.000193	0.000271	71%
CpC before 10 years		tCO2/y,cap	10.362	4.621	
Cp\$ before 10 years		tCO2/\$GDP	0.000263	0.000332	
Last CpC to CpC before 10 years	CpC10	tCO2/y,cap	79.23%	94.73%	83.64%
Last Cp\$ to Cp\$ before 10 years	Cp\$10	tCO2/\$GDP	73.39%	81.48%	90.07%

Table 7 - OECD CCR Rating

Parameter	Parameter Symbol	Value	Weight	Index
Cumulative CO2 in the last 30 years per cumulative GDP in the same period	CCp\$\$	83%	20%	17%
CO2 emissions per capita	CpC	188%	25%	47%
CO2 emissions per GDP	Cp\$	71%	25%	18%
Change in CpC in the last 10 years	CpC10	84%	15%	13%
Change in Cp\$ in the last 10 years	Cp\$10	90%	15%	14%
Σ			100%	107.37%

OECD's CCR is 107, Label F = Red.

OECD's position on the countries list is equivalent to 153 (out of 208).

Table 8 - OECD countries below and above the world CCR

	Countries	tCO2/y
OECD countries CCR<100	28	32%
OECD countries CCR>100	10	68%

The distribution of OECD countries by CCR is similar to all countries of the world: 30% of the countries above the world CCR are responsible for 70% of the CO2 emissions.

Table 9 - OECD A-G groups in 2020

Rating	Ave CCR	tCO ₂ /y	% CO ₂	countries
A	46.9	7,081,740	0%	1
B	55.6	70,755,800	1%	2
C	66.1	400,833,820	4%	4
D	76.8	1,371,481,700	12%	8
E	91.6	1,694,730,060	15%	13
F	121.1	6,771,714,370	60%	8
G	166.3	934,786,000	8%	2

10 OECD countries in Groups F and G are responsible for 68% of the total OECD CO₂ emissions in 2020. The average CCR of Group F is 21% above the world CCR and Group G – 66%.

Table 10 - Group A

Rating	Count	CCR	CCR	tCO ₂ /y
A	1	47	List #	7,081,740
CRI	Costa Rica	47	8	7,081,740

Table 11 - Group B

Rating	Count	CCR	CCR	tCO ₂ /y
B	2	56	List #	70,755,800
SWE	Sweden	55	23	36,514,800
CHE	Switzerland	57	26	34,241,000

Table 12 - Group C

Rating	Count	CCR	CCR	tCO ₂ /y
C	4	66	List #	400,833,820
COL	Colombia	62	41	85,525,800
DNK	Denmark	65	50	28,281,900
FRA	France	67	57	280,032,000
LVA	Latvia	70	67	6,994,120

Table 13 - Group D

Rating	Count	CCR	CCR	tCO ₂ /y
D	8	77	List #	1,371,481,700
GBR	United Kingdom	72	70	326,265,000
MEX	Mexico	72	74	391,707,000
PRT	Portugal	73	78	41,800,000
ESP	Spain	74	83	213,339,000
ITA	Italy	77	89	302,280,000
IRL	Ireland	79	97	35,153,400
LTU	Lithuania	83	106	13,653,100
HUN	Hungary	85	110	47,284,200

Table 14 - Group E

Rating	Count	CCR	CCR	tCO ₂ /y
E	13	92	List #	1,694,730,060
ISR	Israel	86	114	55,008,000
FIN	Finland	87	115	37,595,900
GRC	Greece	88	117	55,610,400
CHL	Chile	89	119	83,833,600
TUR	Turkey	89	121	413,433,000
AUT	Austria	90	122	62,037,500
SVN	Slovenia	90	124	12,866,260
NOR	Norway	91	131	41,196,000
NZL	New Zealand	94	136	34,456,700
SVK	Slovakia	96	138	31,094,700
NLD	Netherlands	96	139	137,850,000
DEU	Germany	96	140	639,380,000
BEL	Belgium	99	145	90,368,000

Table 15 - Group F

Rating	Count	CCR	CCR	tCO ₂ /y
F	8	121	List #	6,771,714,370
EST	Estonia	106	151	9,343,000
ISL	Iceland	108	153	3,328,870
JPN	Japan	111	156	1,042,224,000
LUX	Luxembourg	116	158	8,096,500
CZE	Czechia	118	161	91,855,000
POL	Poland	120	164	303,524,000
KOR	South Korea	142	178	597,633,000
USA	United States	149	180	4,715,710,000

Table 16 - Group G

Rating		Count	CCR	CCR	tCO ₂ /y
G		2	166	List #	934,786,000
CAN	Canada		161	185	534,864,000
AUS	Australia		171	189	399,922,000

Climate Change Rating Results on the Website

The Climate Change Rating Results are available on the website [2].

References

1. Climate Change Rating of Countries - Joseph Nowarski,
DOI:10.5281/zenodo.10677134
2. Nowagreen Climate Change Rating of Countries
<https://nowagreen.com/ccr>

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